

CLAIMS

1. A hip plate, comprising:
a plate body adapted to be attached to a bone; and
5 at least one lag screw adapted for insertion through the plate and into a bone section that is offset from said bone and rotationally lockable to said plate.

2. A plate according to claim 1, wherein said bone is a femur and wherein said offset is a femoral head.

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3. A plate according to any of claim 1-2, comprising a barrel guide having an inner diameter adapted to contain a shaft of said lag screw and axially guide a motion of said lag screw.

15 4. A plate according to claim 3, wherein said barrel is rotationally locked to said plate and wherein said screw is rotationally locked to said barrel.

5. A plate according to claim 3 or claim 4, wherein said barrel guide is adapted for attachment to said plate after said plate is implanted in a human body.

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6. A plate according to any of claims 3-5, wherein said barrel is attached to said plate using a threading.

25 7. A plate according to any of claims 3-6, wherein said barrel is axially locked to said plate preventing motion of said barrel along a main axis thereof.

8. A plate according to claim 7, wherein said barrel is locked using a manually positioned locking element.

30 9. A plate according to claim 7 or claim 8, wherein said barrel is locked using a self-engaging element.

10. A plate according to any of the preceding claims, wherein said lag screw has an expandable distal end.

11. A plate according to claim 10, wherein said distal end is inflatable.
12. A plate according to claim 10 or claim 11, wherein said distal end comprises a plurality
5 of protrusions.
13. A plate according to claim 12, wherein said protrusions comprise axial bars.
14. A plate according to any of claims 10-13, wherein said expandable end is treated to
10 increase elongation.
15. A plate according to any of the preceding claims, wherein said lag screw comprises a
one way fluid valve.
- 15 16. A plate according to claim 15, wherein said valve is adapted to release said fluid when
said valve is axially depressed towards said a distal end of said lag screw.
17. A plate according to any of the preceding claims, wherein said lag screw includes an
axial motion limiter.
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18. A plate according to claim 17, wherein said limiter comprises a slot adapted to be
engaged by a matching protrusion.
19. A plate according to claim 17 or claim 18, wherein said limiter allows some axial
25 motion.
20. A plate according to any of the preceding claims, wherein a shaft section of said peg
has a cross-section that is not circular.
- 30 21. A plate according to claim 20, wherein said peg has an oval cross-section.
22. A plate according to any of the preceding claims, wherein an end of said plate is sharp
enough to push away tissue.

23. A plate according to any of the preceding claims, wherein said plate body fits in a cylinder having a diameter of 30mm.

24. A plate according to any of the preceding claims, wherein said plate body is adapted to fit through a tissue incision of substantially same dimensions as a width of said plate, said width being defined in a direction perpendicular to a long axis of said plate and perpendicular to an insertion axis of said lag screw.

25. A plate according to any of claims 1-24, wherein said body is formed of titanium.

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26. A plate according to any of claims 1-24, wherein said body is formed of a polymer.

27. A plate according to any of claims 1-26, wherein said screw is formed of titanium.

15 28. A plate according to any of the preceding claims, wherein said plate body defines at least one hole for fixation of said plate to cortical bone, using a connector.

29. Apparatus for bone implant removal, comprising:

a guide tube;

20 an implant engaging rod in said tube; and

a hydraulic piston adapted to selectively pull back said rod.

30. Apparatus according to claim 29, wherein said apparatus is designed for an expandable implant.

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31. Apparatus according to claim 30, wherein said guide tube is adapted to collapse said implant.

30 32. Apparatus according to claim 30 or claim 31, wherein said rod is adapted to engage by a threading.

33. Apparatus according to any of claims 30-32, wherein said rod is adapted to release a valve on a specific implant, when engaging said implant.

34. A method of implanting a hip plate, comprising:
inserting a hip plate body to lie against a bone;
assembling a barrel guide in said plate in said body; and
rotationally and axially locking said barrel guide to said plate body.
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35. A method according to claim 34, wherein said barrel locks upon assembly.
36. A method according to claim 34 or claim 35, comprising attaching a drill guide to said plate body.
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37. A method according to any of claims 34-36, comprising inserting a lag screw through said barrel guide.
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38. A method according to any of claims 34-36, comprising limiting axial motion of said lag screw.
39. A method according to any of claims 34-36, comprising inserting a hip pin through said plate body.
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40. A method of hip lag screw removal, comprising:
engaging a lag screw using an engaging rod;
pulling back the engaging rod so that the lag screw enters a guide tube.
41. A method according to claim 40, wherein said pulling back comprises radially compressing at least a portion of said lag screw.
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42. A method according to claim 40 or claim 41, wherein said engaging comprises releasing an internal pressure in said lag screw.
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43. A method according to any of claims 40-42, wherein said pulling back comprises pulling back using hydraulic force.